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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/001,553	10/31/2001	Che-Bin Liu	2000P09023US01	7750

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Intellectual Property Department
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EXAMINER

LEFLORE, LAUREL E

ART UNIT	PAPER NUMBER
2673	4

DATE MAILED: 09/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/001,553	LIU ET AL.	
	Examiner	Art Unit	
	Laurel E LeFlore	2673	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on ____.
 2a) This action is **FINAL**. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-25 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
 5) Claim(s) ____ is/are allowed.
 6) Claim(s) 1-3,5,8-10,13,17-20,22 and 25 is/are rejected.
 7) Claim(s) 4, 6, 7,11,12,14-16, 21, 23 and 24 is/are objected to.
 8) Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 31 October 2001 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 11) The proposed drawing correction filed on ____ is: a) approved b) disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. ____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.
 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) The translation of the foreign language provisional application has been received.
 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) Notice of References Cited (PTO-892) 4) Interview Summary (PTO-413) Paper No(s). ____ .
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) Notice of Informal Patent Application (PTO-152)
 3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ . 6) Other: ____ .

DETAILED ACTION

Drawings

1. The drawings are objected to because figure 3, element 302 should read "Skin-Tone", not "Shin-Tone". A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure is objected to because of the following informalities:

On page 1 line 19, page 3 line 10, "maybe" should be "may be". On page 2 line 5, "commercially" should be "commercial". On page 5 line 16, "controids" should be "centroids" and on line 18, there should not be two periods. On page 10 line 11, "hand be" should be "hand to be". On page 11 line 15, "may" should be "map". On page 13 line 21, "leads" should be "lead". On page 15 line 3, "that small" should be "that a small" and on line 4, "make" should be "makes" and on line 6, there should be no comma after "hierarchically". On page 16 line 1, "are" should be "is". On page 17 line 18, "gestures" should be "gesture" and on line 25, "Equation (2)" should be "Equation (4)".

Appropriate correction is required.

Claim Objections

3. Claims 6, 9 and 23 objected to because of the following informalities: On line 6 of claims 6 and 23, "controids" should be "centroids". On line 10 of claim 9,

- "according a vote" should be "according to a vote". Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-3, 8, 9, 18-20 and 25 rejected under 35 U.S.C. 102(b) as being anticipated by Qiao 6,075,895.

In regard to claim 1, Qiao discloses a method for determining a gesture comprising the steps of: determining a change in a background of an image from a plurality of images (see column 1, lines 64-67 and column 2, lines 1-5; movement of the person in the foreground causes changes in what parts of the background are visible); determining an object in the image (see column 2, lines 15-22 and figure 3, step 181); determining a trajectory of the object through the plurality of images (see column 3, lines 37-39 and figure 11, step 377); and classifying a gesture according to the trajectory of the object (see column 3, lines 27-30 and figure 3, step 185).

In regard to claims 2 and 19, Qiao discloses the step of determining the change in the background comprises the steps of: determining a gradient intensity map for

the background from a plurality of images and for the current image; determining a comparison between the difference and a threshold (see column 2, lines 23-28); and determining a pixel to be a background pixel according to the comparison (see column 2, lines 34-37). Here, generating "the difference between the value of each pixel" is understood to mean determining a gradient intensity map because a gradient is generated by taking a difference between pixel values.

In regard to claims 3 and 20, Qiao discloses that the object includes a user's hand (see column 10, lines 38-51).

In regard to claims 8 and 25, Qiao discloses the step of classifying the gesture comprises the steps of: determining a reference point; determining a correspondence between the trajectory and the reference point; and classifying the trajectory according to one of a plurality of commands (see column 10, lines 38-51). Here, the "hand extended forward" is understood to be a determined reference point. Additionally, this limitation can be read on the "rest gesture" and movement away from that position (see column 10, lines 52-67 and figure 15).

In regard to claim 9, Qiao discloses a method for determining a trajectory of a hand through a plurality of images comprising the steps of: detecting a reference point; updating the reference point as the reference point is varied; detecting a first translation of the hand through the plurality of images; detecting a second translation through the plurality of images; determining a gesture according a vote; and determining whether the gesture is a valid gesture command. (See column 10, lines 38-51; Here, the "hand extended forward" is understood to be a determined

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reference point and is updated as it is varied. The movement of the player with his hand still extended forward causes the translations of the hand.) Here it is understood that an analysis using a neural network (see column 11, lines 3-9) constitutes a vote.

In regard to claim 18, Qiao discloses a program storage device readable by machine, tangibly embodying a program of instructions executable by the machine to perform method steps for determining a gesture (see column 5, lines 9-12).

6. Claims 9, 10, 13 and 17 rejected under 35 U.S.C. 102(e) as being anticipated by Iwamura 6,501,515 B1.

In regard to claim 9, Iwamura discloses a method for determining a trajectory of a hand through a plurality of images comprising the steps of: detecting a reference point (see column 4, lines 56-7; column 5, lines 9-10; and column 1, line 67 to column 2, line 6. The reference point detection is determining if the hand makes a sufficient movement to be a gesture or not. If not, the hand is still at a reference point.); updating the reference point as the reference point is varied (see column 5, lines 11-13); detecting a first translation of the hand through the plurality of images; detecting a second translation through the plurality of images (see column 5, lines 19-23); determining a gesture according a vote (see column 5, line 10); and determining whether the gesture is a valid gesture command (see column 5, lines 26-7 and lines 39-45). Here it is understood that a vote indicates a judgment by the gesture determining device.

In regard to claim 10, Iwamura discloses a reference point that is not interpreted as a gesture command (see column 5, lines 6-10). Here, the reference point is a gesture ("make one rotation"..."return to the start position"), but it is not understood to be a "gesture command" in that it does not incite recognition as a command rather than a starting point.

In regard to claim 13, Iwamura discloses a second translation that is one of a left, a right an up and a down translation (see column 5, line 23 and lines 33-35).

In regard to claim 17, Iwamura discloses a valid gesture that is performed continually for a predetermined time (see column 5, lines 39-45).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5 and 22 rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Qiao 6,075,895 and Iwamura 6,501,515 B1.

While Qiao does not explicitly disclose determining a temporal likelihood and a plurality of moments, the claimed invention in claims 5 and 22 would have been obvious over Iwamura's disclosed method of determining the trajectory of the object through a plurality of images.

Regarding the step of determining, for each pixel, a temporal likelihood across a plurality of images, Iwamura includes a step of dividing each frame (with multiple frames

constituting a plurality of images) into a “plurality of blocks, each containing vectors representative of detected motion of the object.” Iwamura further tracks an object through adjacent video frames by checking these blocks or regions (see column 1, line 60 to column 2, line 6). It would have been obvious to one skilled in the art at the time of the invention to modify Iwamura’s method, using one pixel as a “block” to provide a more accurate tracking.

Regarding the step of determining a plurality of moments according to the temporal likelihoods, Iwamura further tracks the object by determining if the vectors of each of these regions “made one rotation clockwise or counterclockwise and...returned to the start position”. In this step, Iwamura’s observation of the changes in the object’s motion determines a plurality of moments. One would have been motivated to use Iwamura’s step of determining a plurality of moments in order to determine an object’s trajectory.

To one of ordinary skill in the art, it would have been obvious to use Iwamura’s processes in the system of Qiao because this will allow the system to better and more accurately track the hand motions and to determine what are actual gestures, as well as interpret the gestures and, further, because both systems are for the tracking and interpreting of gestures.

Allowable Subject Matter

7. Claims 4, 6, 7, 11, 12, 14-16, 21, 23, and 24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Nguyen 6,072,494. Note column 2, lines 15-30 in reference to claims 1, 8 and 25 of the claimed invention. Note column 4, lines 34-44 in reference to claim 18 of the claimed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laurel E LeFlore whose telephone number is (703) 305-8627. The examiner can normally be reached on Monday-Friday 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on (703) 305-4938. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

LEL

JOSEPH MANCUSO
PRIMARY EXAMINER